

Guidance

Technical Booklet

B

Materials and workmanship

July 2013

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Technical Booklets

This Technical Booklet, which takes effect on 1st July 2013, is one of a series that has been prepared by the Department of Finance and Personnel (the Department) for the purpose of providing practical guidance with respect to the technical requirements of the Building Regulations (Northern Ireland) 2012 (the Building Regulations).

At the back of each Technical Booklet is a list of all the Technical Booklets that have been prepared and published by the Department for this purpose.

The guidance given in a Technical Booklet includes performance standards and design provisions relating to compliance with specific aspects of the Building Regulations for the more common (normal) building situations.

If the guidance in a Technical Booklet is followed there will be a presumption of compliance with the requirements of those Building Regulations covered by that guidance. However, this presumption can be overturned, so simply following the guidance does not guarantee compliance. For example, if a particular circumstance is not one of the more common building situations the design provisions given in the Technical Booklet may not be appropriate.

There are likely to be alternative ways of demonstrating compliance with the relevant requirements of the Building Regulations other than by following a design provision given in a Technical Booklet. There is therefore no obligation to adopt any particular provision set out in a Technical Booklet, should you decide to comply in some other way. However, you will have to demonstrate that your alternative solution meets the relevant requirements of the Building Regulations by those other means.

This Technical Booklet

The guidance contained in this Technical Booklet relates only to the requirements of regulations 23 and 24(2) in Part B. The work will also have to comply with all other requirements of the relevant Building Regulations.

The Building Regulations are made for specific purposes, primarily securing the health, safety, welfare and convenience of people and for the conservation of fuel and power. Standards and technical specifications are relevant guidance to the extent that they relate to these purposes. However, they may also address other aspects of performance such as serviceability, or aspects which although they relate to health and safety are not covered by the Building Regulations.

Where this Technical Booklet makes reference to a named standard, the relevant version of the standard is the one listed in the Appendix. However, if this version has been replaced or updated by the issuing standards body, the new version may be used as a source of guidance provided that it continues to address the relevant requirements of the Building Regulations.

Other legislation

The Construction Products Regulation (EU 305/2011) requires that construction products that are covered by a harmonised European product standard or conform to a European Technical Assessment should normally have CE marking.

Part B Regulations

Part B (comprising regulations 22 to 24) of the Building Regulations, which sets out the requirements for materials and workmanship, has been replicated below for the convenience of the user of this Technical Booklet and is taken directly from the Building Regulations (Northern Ireland) 2012, in operation at the date of publication of this Technical Booklet.

Any person who intends to demonstrate compliance with the Building Regulations by following the guidance given in this Technical Booklet is advised to ensure that the regulations below, are current on the date when plans are deposited or notices given to the district council.

As Part A (comprising regulations 1 to 21) of the Building Regulations sets out the interpretation along with the procedural requirements relating to the application of the regulations, the Department advises that all Parts of the Building Regulations are read in conjunction with Part A of those regulations.

The Building Regulations (Northern Ireland) 2012 and any subsequent amendment may be viewed by following the links from the Department's website at "www.buildingregulationsni.gov.uk."

PART B

Materials and workmanship

Interpretation

22. In this Part—

“Harmful substances” includes fumes and vapours; and

“Relevant work” means—

- (a) the erection of a building;
- (b) the structural alteration or extension of a building;
- (c) the provision of any service or fitting; or
- (d) the backfilling of any excavation carried out in connection with (a), (b) or (c).

Fitness of materials and workmanship

23. In any relevant work—

(a) the materials used shall—

- (i) be of a suitable nature and quality in relation to the purposes for and the conditions in which they are used;
- (ii) be adequately mixed and prepared;
- (iii) be applied, used or fixed so as adequately to perform the functions for which they are designed; and
- (iv) not continue to emit any harmful substance longer than is reasonable in the circumstances; and

(b) the standards of materials and workmanship need be no more than are necessary to—

- (i) secure the health, safety, welfare and convenience of persons in or about the building; and
- (ii) further the conservation of fuel and power.

Urea formaldehyde foam

24.—(1) Subject to paragraph (2), in-situ foamed Urea formaldehyde shall not be used in the erection, structural alteration or extension of a building.

(2) In-situ foamed Urea formaldehyde may be used for filling the cavity of a cavity wall having an inner leaf constructed of bricks or blocks, provided that it is—

- (a) suitable for such an application; and
- (b) satisfactorily installed.

Fitness of materials and workmanship (regulation 23 in Part B)

Performance

- 0.1 It is the view of the Department that the requirements of regulation 23 in Part B will be met where –
- (a) materials are of a suitable nature and quality in relation to the purposes and conditions of their use; and
 - (b) the workmanship is such that –
 - (i) where relevant, materials are adequately mixed or prepared; and
 - (ii) materials are applied, used or fixed so as to perform adequately the functions for which they are intended; and
 - (c) materials do not continue to emit any harmful substance longer than is reasonable in the circumstances.
- 0.2 To be of a suitable nature and quality, materials –
- (a) for use as the weather resisting part of an external wall or roof should not rely on being painted, or coated, surfaced or rendered with any other material which when used, does not in itself constitute effective resistance against weather; or
 - (b) which depend on periodic maintenance, replacement or renewal should be readily accessible or positioned so that such maintenance, replacement or renewal is practicable.

Limitations

- 0.3 Regulation 23 in Part B applies across all of the substantive Parts of the Building Regulations.
- Regulation 23(b) in Part B limits the standards of materials and workmanship to be no more than necessary to –
- (a) secure the health, safety, welfare and convenience of persons in or about the building; and
 - (b) further the conservation of fuel and power.

Introduction to provisions in Section 2

- 0.4 The guidance in Section 2 is to provide aids which –
- (a) may be used for establishing the suitability of a material for use for a specific purpose; and
 - (b) may be used to establish the adequacy of workmanship.

The guidance also addresses the suitability of certain materials such as short lived materials and materials susceptible to changes in their properties. Specific provisions are given regarding materials likely to be adversely affected by moisture or by harmful substances in the sub-soil.

Urea formaldehyde foam (regulation 24 in Part B)

Performance

- 0.5 Regulation 24(1) in Part B prohibits the use of Urea formaldehyde foam subject to the provisions of regulation 24(2) in Part B.

It is the view of the Department that the requirements of regulation 24(2) in Part B will be met if the risks to the health of persons in buildings are eliminated or reduced to an extent whereby any formaldehyde fumes given off by Urea formaldehyde foam filling the cavity of a cavity wall does not give rise to an irritant concentration. This can be achieved by ensuring that the inner leaf of the cavity wall provides a suitable barrier to the passage of formaldehyde fumes.

Introduction to provisions in Section 3

- 0.6 The guidance in this Section is to ensure reasonable precautions are taken to eliminate or reduce to an acceptable level, the permeation of toxic fumes into a building when Urea formaldehyde foam has been inserted into the cavity of a cavity wall.

- 1.1 In this Technical Booklet the following definitions and glossary of terms apply –

Definitions

- 1.2 **Harmful substances** – has the meaning assigned to it by regulation 22 in Part B of the Building Regulations.

Materials – has the meaning assigned to it by regulation 2 in Part A of the Building Regulations.

Glossary of terms

- 1.3 **BSI** – The British Standards Institution, is the UK national standards body. BSI publishes European standards in the UK as BS EN. Further information is available at www.bsigroup.co.uk

CEN – The Comité Européen de Normalisation, is the European standards body that prepares harmonised European product standards. Declarations of Performance against such standards should provide sufficient information for any Member State to allow the product onto its market and for specifiers and users to be able to assess whether the product is suitable for its intended use.

CEN also prepares non-harmonised European standards such as test or calculation standards and standards for products or services that have not been mandated under a CE Marking Directive. It does not issue standards directly, only through national standards bodies; BSI is the designated standards body for the UK.

Further information is available at: www.cen.eu

EA – European co-operation on Accreditation, is the umbrella organisation for all national accreditation bodies in Europe. Product certification bodies, inspection bodies and test laboratories approved by national accreditation bodies belonging to the EA are equivalent to those approved by UKAS. For further information see: www.european-accreditation.org

European Technical Assessments – A favourable technical assessment issued under the European Construction Products Regulation 2011 that allows a manufacturer to affix CE markings on its products. Further information is available at www.eota.eu

ISO – International Organisation for Standardisation, is the worldwide federation of national standards institutions. Standards are identified by 'ISO' and a number. ISO standards may be published separately or transposed into the UK as BS ISO or BS EN ISO. Further information is available at www.iso.org

NANDO – New Approach Notified and Designated Organisations is an information system produced by the European Commission. It lists the harmonised European standards and the bodies notified by member states to carry out conformity assessment tasks for CE marking. Further information is available at:
<http://ec.europa.eu/enterprise/newapproach/nando>

UKAS – the United Kingdom Accreditation Service is the sole national accreditation body recognised by the UK government to assess, against internationally agreed standards, organisations that provide certification, testing, inspection and calibration services. Accreditation by UKAS demonstrates the competence, impartiality and performance capability of these organisations. Further information is available at: www.ukas.com

Materials

General

- 2.1 Technical Booklets contain references to materials covered by harmonised European product standards, British Standards and other technical specifications. However, as there is no obligation to adopt any particular solution contained in a Technical Booklet in order to meet a functional requirement, the references are not exclusive and other materials may be suitable in the particular circumstances.

Ways of establishing the fitness of materials

- 2.2 There are a number of ways in which the suitability of a material for use for a specific purpose may be assessed. The following are examples of ways which may be used for establishing this (see paragraphs 2.3 to 2.10).

CE marking under the Construction Products Regulation

- 2.3 Many materials are construction products that have CE marking under the Construction Products Regulation (EU 305/2011).

The Construction Products Regulation requires that construction products on the EU market covered by a harmonised European product standard should normally have CE marking. In addition, manufacturers of products not covered by a harmonised standard can choose to affix CE marking to their products by obtaining a European Technical Assessment.

(You can find a list of the harmonised product standards under the Construction Products Regulation on the NANDO information system website at:

<http://ec.europa.eu/enterprise/newapproach/nando/index.cfm?fuseaction=cpd.hs>)

The CE marking includes the reference of the product standard and levels or classes of performance being declared against some or all of the characteristics covered by the standard. The CE marking should be on the product, its label, the packaging or accompanying documents. The CE symbol by itself does not necessarily indicate that the material is suitable for the building work.

In addition to CE marking, the product will have a Declaration of Performance containing more detailed information on the product. This may be a paper or electronic document, or it may be on a website.

It is essential to check that the declared performance is suitable for the building work.

In the absence of indications to the contrary, for those verifying compliance with the Building Regulations, it is reasonable to assume that the information in the CE marking and Declaration of Performance is accurate and reliable, and that the product meets the declared performance.

If the declared performance of a product is suitable for its intended use, then such use should not be prohibited or impeded.

CE marking under other EU Directives and Regulations

- 2.4 Products may also be CE marked under European legislation, such as the Gas Appliances Directive or the Pressure Equipment Directive. Such CE marking shows that the product meets the essential requirements set out in the relevant legislation – for example, minimum safety requirements – and can be placed on the EU market .

Some products will have CE marking in accordance with both the Construction Products Regulation and other legislation. The CE marking shows that the product complies with the requirements in all relevant EU legislation.

British Standards

- 2.5 Nearly all British Standards for construction products are the British versions of the harmonised European standards (ENs) used for CE marking. The BSI numbering policy is to adopt the CEN numbering, prefaced with BS e.g. BS EN 197-1.

Some British Standards are the British versions of non-harmonised European standards; these also adopt the CEN numbering, prefaced with BS. These do not contain an Annex ZA, so CE marking cannot be affixed to products made to these standards.

Some British Standards for products not covered by a European standard will continue to exist.

Where a construction product has been made and assessed in accordance with one or more British Standard described in the two preceding paragraphs, may show whether or not the product is suitable for its intended use.

Other national and international technical specifications

- 2.6 An international technical specification, including those prepared by ISO, or a national technical specification of a country other than the UK, may be used to demonstrate that a product not covered by a harmonised European standard meets the performance requirements of the Building Regulations.

Where necessary, the person intending to carry out the work should obtain translations of specifications and demonstrate to the district council how the material meets the requirements of regulation 23 in Part B.

It should be noted that the national technical specifications of EU Member States (and non-EU countries that are full members of CEN) are being progressively replaced by harmonised European standards, as is the case with British Standards.

Independent certification schemes

- 2.7 The material has certified compliance under an independent certification scheme. There are many independent certification schemes in the UK and elsewhere that may provide information on the performance of a material. Such schemes certify that a material complies with the requirements of a recognised document and is suitable for its intended purpose and use. These may be in addition to, but not conflict with, CE marking.

It should be noted that materials which are not certified by an independent scheme may still conform to a relevant standard.

Accreditation of a certification body by a national accreditation body belonging to the European co-operation for Accreditation (EA) provides a means of demonstrating that their certification scheme can be relied upon. In the UK, most independent certification bodies are accredited by the United Kingdom Accreditation Service (UKAS), who belong to the EA.

It is important to check the scope of the accreditation of certification bodies as accreditation may cover only part of the certification body's testing or certification business.

Tests and calculations

- 2.8 Where there is no relevant harmonised European standard, tests, calculation or other means may be used to demonstrate that the material can perform the function for which it is intended. UKAS or an equivalent national accreditation body belonging to the EA may accredit the testing laboratories; this accreditation provides a means of showing that the tests can be relied on.

Past experience

- 2.9 Past experience, such as in a building in use, may show that the material is capable of performing the function for which it is intended.

Sampling

- 2.10 Regulation 16 in Part A allows a district council to take, as it considers necessary, samples of materials either used or to be used in building work, to establish if that material complies with the provisions of the Building Regulations.

Suitability of certain materials

Short-lived materials

- 2.11 Some materials, in the absence of special care, may be considered unsuitable because of their rapid deterioration in relation to the expected life of the building.

A short-lived material which is readily accessible for inspection, maintenance and replacement may meet the requirements of the Building Regulations provided that the consequences of failure are not likely to be serious in regard to the health or safety of persons in and around the building.

Where a short-lived material is not readily accessible for inspection and maintenance or replacement and the consequences of failure are likely to be serious with regard to health or safety, it is unlikely that the material will meet the requirements of the Building Regulations.

(Paragraph 0.2 describes circumstances in which materials may be considered to be of a suitable nature and quality.)

Materials susceptible to changes in their properties

- 2.12 Some materials may undergo changes to their properties when they are exposed to certain environmental conditions which may affect their performance over time.

Materials that are susceptible to changes in their properties may be used in building work where these changes do not adversely affect their performance. Such material will meet the requirements of the Building Regulations provided that their final residual properties, including their structural properties, meet both of the following conditions –

- (a) residual properties can be estimated at the time of their incorporation in the work; and
- (b) residual properties are shown to be adequate for the building to perform the function for which it is intended for the expected life of the building.

Resistance to moisture

- 2.13 Any material which is likely to be adversely affected by moisture from the ground, weather or condensation will be suitable if –

- (a) the construction will resist the passage of moisture to the material; or
- (b) the material is treated or otherwise protected from moisture.

Resistance to substances in the subsoil

- 2.14 Any material in contact with the ground or in the foundations will be suitable if it is capable of resisting attacks by deleterious material in the subsoil such as sulfates.

Workmanship

Ways of establishing the adequacy of workmanship

- 2.15 The following are examples of ways which may be used to establish the adequacy of workmanship (see paragraphs 2.16 to 2.22).

CE marking

- 2.16 If a material has CE marking, workmanship may be specified in the relevant European Technical Assessment or harmonised product standard.

Standards

- 2.17 Methods of carrying out different types of work are also given in British Standards or other appropriate technical specifications. (Note: the BS 8000 series of standards on Workmanship on building sites combines guidance from other BSI Codes and Standards. See Appendix.)

Independent certification schemes

- 2.18 Some independent certification schemes specify how workmanship will deliver a declared level of performance. The person carrying out the work should show that the workmanship will provide the appropriate level of protection and performance.

Management systems

- 2.19 The quality of workmanship is covered by a quality management scheme such as one that complies with the relevant recommendations of BS EN ISO 9000, and related series of standards. There are a number of such UKAS accredited schemes.

Past experience

- 2.20 Past experience of workmanship, such as in a building in use, may show that the method of workmanship is capable of performing the function for which it is intended.

Tests

- 2.21 Tests can be used to show that workmanship is appropriate.

In the following two instances, the Building Regulations require those carrying out building work to have testing carried out to demonstrate compliance -

- (a) sound insulation testing as required by regulation 53 in Part G of the Building Regulations; and
- (b) testing of fixed mechanical ventilation systems and any associated controls as required by regulation 65 in Part K of the Building Regulations.

Pressure testing may be used to demonstrate compliance with regulation 40(2) in Part F. However, it should be noted that such pressure testing is not a requirement of the Building Regulations; the circumstances of the building and its design parameters may allow the designer/builder to demonstrate compliance by means other than testing.

- 2.22 A district council has the power to require tests as prescribed in regulation 15 in Part A of the Building Regulations, to be carried out in relation to drains and private sewers as necessary, to establish compliance with Part N of the Building Regulations. These prescribed tests may also be carried out by that district council.
- 2.23 Regulation 16 in Part A allows a district council to take, as it considers necessary, samples of materials to be used in building work, to establish if the adequacy of workmanship relating to the use of that material complies with the relevant requirements of the Building Regulations.

Section 3 Urea formaldehyde foam

General provisions

- 3.1 Other than the circumstances outlined in 3.2 urea formaldehyde foam should not be used in the erection, structural alteration or extension of a building.
- 3.2 Foam insulating materials which give off formaldehyde fumes either when used or later in normal use, may be used to insulate the cavity in a cavity wall where there is a continuous barrier which will minimise, as far as practicable, the passage of fumes into the building. BS 8208-1 gives guidance on factors to be considered when assessing the suitability of existing masonry external cavity walls for filling with thermal insulants.
- 3.3 A cavity wall which has been determined to be suitable for foam filling may be insulated with urea formaldehyde foam where –
 - (a) the inner leaf of the wall is built of masonry (bricks or blocks);
 - (b) the person carrying out the work holds (or operates under) a current Certificate of Registration of Assessed Capability for the work to be undertaken;
 - (c) the in-situ foamed urea formaldehyde is manufactured in accordance with the relevant recommendations of BS 5617; and
 - (d) the installation is in accordance with BS 5618.

Appendix Publications referred to

BS EN ISO 9000: 2005	Quality management systems. Fundamentals and vocabulary.
BS EN ISO 9001: 2008	Quality management systems. Requirements.
BS 5617: 1985	Specification for Urea-formaldehyde (UF) foam systems suitable for thermal insulation of cavity walls with masonry or concrete inner and outer leaves.
BS 5618: 1985	Code of practice for thermal insulation of cavity walls (with masonry or concrete inner and outer leaves) by filling with Urea-formaldehyde (UF) foam systems. AMD 6262 1990, AMD 7114 1992.
BS 8000-1: 1989	Workmanship on building sites. Code of practice for excavation and filling.
BS 8000-2-1: 1990	Workmanship on building sites. Code of practice for concrete work. Mixing and transporting concrete. AMD 9324 1997.
BS 8000-2-2: 1990	Workmanship on building sites. Code of practice for concrete work. Sitework with in situ and precast concrete.
BS 8000-3: 2001	Workmanship on building sites. Code of practice for masonry.
BS 8000-4: 1989	Workmanship on building sites. Code of practice for waterproofing.
BS 8000-5: 1990	Workmanship on building sites. Code of practice for carpentry, joinery and general fixings.
BS 8000-6: 1990	Workmanship on building sites. Code of practice for slating and tiling of roofs and claddings.
BS 8000-7: 1990	Workmanship on building sites. Code of practice for glazing.
BS 8000-8: 1994	Workmanship on building sites. Code of practice for plasterboard partitions and dry linings.
BS 8000-9: 2003	Workmanship on building sites. Cementitious levelling screeds and wearing screeds. Code of practice.
BS 8000-11: 2011	Workmanship on building sites. Internal and external wall and floor tiling. Ceramic and agglomerated stone tiles, natural stone and terrazzo tiles and slabs, and mosaics. Code of practice.

BS 8000-12: 1989	Workmanship on building sites. Code of practice for decorative wallcoverings and painting.
BS 8000-13: 1989	Workmanship on building sites. Code of practice for above ground drainage and sanitary appliances.
BS 8000-14: 1989	Workmanship on building sites. Code of practice for below ground drainage.
BS 8000-15: 1990	Workmanship on building sites. Code of practice for hot and cold water services (domestic scale).
BS 8000-16: 1997+A1:2010	Workmanship on building sites. Code of practice for sealing joints in buildings using sealants.
BS 8208-1: 1985	Guide to assessment of suitability of external cavity walls for filling with thermal insulants. Existing traditional cavity construction. AMD 4996 1985.

Technical Booklets

The following list comprises the series of Technical Booklets prepared by the Department for the purpose of providing practical guidance with respect to the technical requirements of the Building Regulations (Northern Ireland) 2012.

Technical Booklet B	Materials and workmanship
Technical Booklet C	Preparation of site and resistance to contaminants and moisture
Technical Booklet D	Structure
Technical Booklet E	Fire safety
Technical Booklet F1	Conservation of fuel and power in dwellings
Technical Booklet F2	Conservation of fuel and power in buildings other than dwellings
Technical Booklet G	Resistance to the passage of sound
Technical Booklet H	Stairs, ramps, guarding and protection from impact
Technical Booklet J	Solid waste in buildings
Technical Booklet K	Ventilation
Technical Booklet L	Combustion appliances and fuel storage systems
Technical Booklet N	Drainage
Technical Booklet P	Sanitary appliances, unvented hot water storage systems and reducing the risk of scalding
Technical Booklet R	Access to and use of buildings
Technical Booklet V	Glazing

Any person who intends to demonstrate compliance with the Building Regulations by following the guidance given in a Technical Booklet is advised to ensure that the guidance is current on the date when plans are deposited or notice given to the district council.